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Degrees of resilience: profiling psychological resilience and prospective academic achievement in university inductees

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Abstract

University inductees may be increasingly vulnerable to stressors during transition into higher education (HE) and require psychological resilience to achieve academic success. The aims of this study were to profile inductees' resilience and investigate links to prospective end of year academic achievement. Initial findings from a validated Connor-Davison Resilience Scale (CD-RISC) suggested that resilience and end of Year 1 grades were similar for all 1534 inductees in a single UK university. A four-stage analysis revealed that incremental resilience was more facilitative of females' prospective academic attainment, whereas resilience was less functional and more convoluted for males. This distinctive study has implications for student support practices and highlights that the relationship between resilience and academic achievement requires further consideration in HE.

Key words: inductees, higher education, psychological resilience, prospective academic achievement

Degrees of resilience: profiling psychological resilience and prospective academic achievement in university inductees

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Introduction

Over recent years, academic, relationship and financial difficulties may all have placed increasing pressures upon university students' capacity to complete their studies. The strain upon psychological well-being may be most pronounced for full-time undergraduate students just starting university (Cooke, Berwick, Barkham, Bradley & Audin, 2006) and may result in impaired academic performance and future progression (Andrews & Wilding, 2004). Further, understanding personal characteristics related to inductees' prospective academic achievement may raise the awareness of all the groups interested in helping new students become assimilated into higher education (HE) so they complete their studies with optimal value.

First year non-completers have identified that poor transition into HE can contribute to failure to progress. This reflects (i) inadequate preparation for university (ii) institutional shortcomings and (iii) the incapacity to cope with demands from the HE environment (Yorke, 2000). Transitions across the lifespan generally involve significant changes to an individual's role or environment, presenting both hazards and opportunities for growth (Sugarman, 1986). More specifically, with certain economic circumstances in recent years, transitions into HE may have become increasingly demanding for inductees resulting increased demand being placed upon in-house support services. . Within a fast-paced, economically uncertain climate,

students and carers may be required to continually adapt to new challenges to facilitate productive functioning over time (Bimrose & Hearne, 2012). Such “career resilience” may denote the motivational capacity of students to self-manage difficult transitions (Richardson, 2002), and the capacity of academic staff and support services to promote this force for growth while operating in difficult target driven settings (Bimrose, Brown, Barnes, & Hughes, 2011).

Attending university has traditionally provided one potential buffer for mental incapacity in university students (Royal College of Psychiatrists, 2003). However, a number of inductees have presented worsening levels of mental ill-health compared to young people in the general population (Association for University & College Counselling, 2006; Monk, 2004; Roberts & Zelenyanski, 2002; Royal College of Psychiatrists, 2006). Although this vulnerability can be partly explained by a recent expansion of the plurality of new learners amplified by widening participation policies (Connell, Barkham & Mellor-Clark, 2007), similar problems are reported within more prestigious and traditional universities (Bates, 2010; Paton, 2010). On average, approximately one in ten of full-time first degree university inductees, especially from areas with the lowest levels of enrolment within HE, fail to continue beyond their first year and over twice as many never graduate (Higher Education Statistics Agency, 2009).

Psychological resilience

Within transitions there are many types of change and varying degrees of impact (Bridges, 2004). Despite the psychological disruption this may cause, many new students are retained in HE and achieve academic success which attests to the importance of adaptability (Jimerson, Egeland & Teo, 1999). Demonstrating such competent functioning in difficult circumstances may indicate the presence of *psychological resilience*, defined as a process, capacity or outcome of successful adaptation during and following risk exposure (Luthar, 2006; Masten,

Burt & Coatsworth, 2006). This concept has emerged from three waves of research into (i) personal characteristics (e.g. Werner & Smith, 1992), (ii) interactive processes (e.g. Luthar, 2006) and (iii) theory-driven interventions (e.g. Masten, Burt & Coatsworth, 2006). Collectively these explain the emergence of positive developmental pathways that ameliorate behavioural and emotional problems in young people. Embracing the tenets of Positive Psychology (Seligman & Csikszentmihalyi, (2000), psychological resilience reflects a shift in emphasis away from deficits in functioning (how to remedy what is wrong) toward the promotion of strengths-based psychosocial processes, which are central to a broader concept of wellness and positive functioning (Sameroff, 1995, Sroufe, 1997). Just as multiple risk factors surrounding a new student may lay the foundation for a negative chain of events leading to unfavourable outcomes, resilience supports the development of assets and resources within and surrounding the individual (i.e. self-efficacy, peer friendships) which ensue a positive chain reaction leading to protection from adversity and favourable outcomes (Daniel & Wassell, 2002; Egeland, Carlson, & Sroufe, 1993).

This positive adaptive capability may not so much imply invulnerability or immunity from stress (Garmezy, 1993; Layne, Warren, Watson & Shalev, 2007) or indeed, an absence of emotional distress (Luthar, Doernberger, & Zigler, 1993), but the maintenance of competent functioning in difficult times. In HE terms, this could be akin to students acquiring positive educational outcomes in the presence of risks to mental health. Alternatively, it may be manifest in students detaching themselves from a context which they regard as destabilising their well-being. Despite perturbations in functioning, psychological resilience generally involves a healthy, stable trajectory of functionality (Norris, Tracy, & Galea, 2009; Skodal, 2010) ranging from returning to a state of equilibrium to developing conditions of flourishing (Calhoun & Tedeschi, 2004). This suggests resilience may constitute protective resistance derived from overcoming previous challenge (Hammond, 2004; Vanderpol, 2002) which may also contribute to prospective capabilities (Shaikh & Kauppi, 2010).

The value of resilience for supporting inductees within HE resides in understanding those personal characteristics and surrounding ecologies which contribute to prospective success. Resilience has predicted academic attainment in high school students (Capella & Weinstein, 2001; Gonzalez & Padilla, 1997; Martin & Marsh, 2006; Nota, Soresi & Zimmerman, 2004) where the conceptual frameworks of *academic resilience* and *academic buoyancy* have been developed to identify factors which may protect against stress (Martin & Marsh, 2008, 2009). Personal attributes including relatedness, a sense of mastery and spirituality (Prince-Embury, 2011; Kim & Esquivel, 2011) and support from parents and teachers (Bryan, 2005; Mullis, Rathge & Mullis, 2003; Prince-Embury, 2008) have contributed to resilience being used to underpin mental health services and academic success in school settings (Esquivel, Doll & Oades-Sese, 2011, Doll, Jones, Osborn, Dooley & Turner, 2011). In contrast, resilience has been less prominent in HE; limited understanding may have reflected inadequate pedagogy and support, especially for new groups of students with distinctive needs beyond those of the stereotypical HE learner (Walker, Gleaves & Grey, 2006). Nevertheless, the attention placed on developing strength-based behaviours - such as learned resourcefulness (Akgun & Ciarrochi, 2003), emotional intelligence (Parker, Summerfeldt, Hogan & Majeski, 2004), and social connectivity (Kantanis, 2000) - has helped moderate the impact of academic stress on first year inductees and aided their transitions into HE.

Gender-related resilience

Given the complex array of personal and environmental interactions which may affect adaptive capacity (Kaplan, 1999), psychological resilience may vary by gender, culture, group, context and time (Harvey & Delfabbro, 2004). In HE, this may involve students deploying gender-related methods of adaptation with varying degrees of success. Male

students endure a greater variety of mental health issues (Kleinfeld, 2000), underachieve across a range of HE performance benchmarks (Higher Education Policy Institute, 2009), and yet seem averse to counselling. This reluctance to acquire help could represent the male tendency to cope by attributing failure externally to preserve an image of self-reliance and invulnerability. Undergraduate male students who experienced greater gender role conflict, and who possessed highly masculine attitudes, were less likely to self-disclose through counselling (Pedersen & Vogel, 2007; Robertson & Fitzgerald, 1992). This mask of bravado or *pseudo-resilience*, which is especially prevalent during adolescence, may project confidence yet hide a troubling sense of isolation (Pollack, 2006).

In contrast, and notwithstanding that female students report higher levels of anxiety (Andrews & Wilding, 2004), disordered eating and concurrent self-harm (Wright, Bewick, Barkham, House, & Hill, 2009), they also record the highest number of admissions and completions, higher degree classifications and fewer drop-outs (Higher Education Policy Institute, 2009). The capacity of female students to perform effectively despite negative affect may indicate the functionality of the female preference to cope with stress by adopting relation-based “tend and befriend” responses (Taylor, Klein, Lewis, Gruenewald, Gurney, & Updegraff, 2000). While females tend to attribute failure internally (by readily denigrating themselves and displaying distress), they also value the mutuality of social connections where they can talk about their feelings and share sadness, all characteristics of *relational resilience* (Hartling, 2003; Jordan, 2006). Further, being emotionally expressive within a culture which values the contribution of its members, such as in HE, may help to facilitate social esteem which promotes a collective buffering of stress. Evidence that friend support plays a protective role against academic stress has been reported among undergraduate students (Wilks, 2008; Wilks & Spivey, 2009). This predilection of females for social integration may also suit collaborative teaching methods and continuous assessment; increasingly favoured in schools and HE and considered, in part, responsible for creating a “gender achievement gap” (Higher Education Policy Institute, 2009). It may also help to engender supportive peer group

relationships during the early part of courses which is recognised as an enabling factor for successful transitions and essential for student retention in HE (Wilcox, Winn & Fyvie-Gauld, 2005).

Characterising psychological resilience in HE inductees

Luthar, Chichetti, & Becker (2000) suggest that variability inherent to adaptive functioning does not invalidate resilience as a measure of successful adjustment. Although it may be appropriate to accept that different notions of resilience - such as *academic resilience* - better explain context-specific patterns of behaviour (Martin & Marsh, 2006), a generic set of psychosocial attributes and mechanisms may help to understand how and why specific individuals and / or groups adapt and achieve despite different adversities. This belief has led to the design and use of standardised psychometric instruments which explore multidimensional characteristics of resilience to inform a range of interventions with young people (e.g. Connor & Davidson, 2003; Wagnild & Young, 1993). In particular, the Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003) identifies salient features of resilience, such as personal competence and tenacity, secure relationships, trust in one's instincts, feelings of control, and acceptance of change which possess clinical relevance for the identification of psychopathology.

Given that educational attainment in HE is predicated upon the management of increasing levels of cognitive and affective complexity, universities may need to understand the trajectories by which new students become healthy, functional adults (Hammond, 2004). Amid concerns for unexpectedly high rates of non-continuation and drop-out, there have been calls to understand the psychological well-being of university students on entry and longitudinally throughout the academic cycle (Cooke et al., 2006; Grant, 2002). Indeed, gaining insight into the character strengths of university applicants may be a more effective tool for selecting those who are more likely to complete their studies than traditional

qualification entry grades (Mathews, 2012; Tough, 2011). Within academic transitions, resilience represents a dynamic process, reflecting patterns of functioning in response to changing circumstances or personal responses (Schoon, 2006). With this in mind, profiling inductees' psychological resilience may offer insight into the prospective capabilities of those students who may adapt and endure in the first year of HE and acquire academic success. At present, there are no studies which have evaluated student's psychological resilience on entry to ascertain links to mental well-being and academic attainment. This undertaking may reveal distinctive patterns of adaptive capacity which help to target assistance for meeting transitional, academic and pastoral needs.

Based upon these observations, the purpose of the present study was to establish the following:

- To profile the psychological resilience of a sample of first year university inductees and highlight links to prospective academic performance (end of Year 1 academic outcomes)

Method

Participants

A Sport and Education faculty from a single UK University provided the convenient, purposive sample of inductees who volunteered to take part in the study within the first weeks of their course. The sample included 1534 full-time first degree students with a mean (M) age of 18.70, standard deviation (SD 1.66), recruited over four consecutive years (2005-2008). Participants were predominately White (96.8%) and just over half (51.8%) were male (794). Across the UK HE sector in 2010/11, over two thirds of all full-time first degree students

were either 18 or 19 years of age on entry, 84.7% were White and 45.8% were male (Higher Education Statistics Agency, 2012).

This post-1992 University annually enrolled approximately 6,000 new full-time first degree inductees. More than nine of 10 students were state educated and over a third came from socio-economic groups 4-7 (i.e. lower supervisory and technical, routine and semi-routine occupations) (Higher Education Statistics Agency, 2012) confirming the University's commitment to widening participation. The Universities and Colleges Admissions Service (UCAS) tariff for admission into the faculty ranged from 180 to 280 points. Advanced (A) Level qualifications possess an incremental scale of 20 tariff points for entry into HE. The lowest grade (E) is awarded 40 points rising to a maximum of 140 points for an A* grade.

All participants gave informed consent for their involvement.

Design and Measures

Following institutional ethical approval, the study comprised four stages of investigation. All analyses were conducted using Statistics Package for the Social Sciences (SPSS) version 19.0 (SPSS Statistics, 2011).

Stage 1

A self-report Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003) suitable for use with older adolescents in the context of education (Campbell-Sills & Stein, 2007; Singh & Yu, 2010) was completed by inductees. The CD-RISC is used to calculate total resilience (0-100) and five contributory subscale scores of (i) Competence (0-32), (ii) Trust (0-28), (iii) Change (0-20), (iv) Control (0-12), and (v) Spirit (0-8). This instrument is

comprised of 25 phrases (e.g., I adapted to change) with scoring ranging from 0 (Not at all true) to 4 (True nearly all the time), with higher scores reflecting greater resilience.

A recent review of 19 resilience instruments (Windle, Bennett & Noyes, 2011), ranked the CD-RISC highest on total quality assessment and within the top three measures for psychometric ratings of *property* (content, criteria and construct validity) and *reproducibility* (reliability, consistency, responsiveness and interpretability). From the original validation of the instrument, internal consistency (Cronbach's α) for the full scale was 0.89, and item-total correlations for the five subscales ranged from 0.30 to 0.70. Test-re-test reliability demonstrated a high level of agreement with an intra-class correlation coefficient of 0.87. Construct validity was confirmed with high convergent correlations ($r = 0.83$, $p < 0.001$) with the Kobasa Hardiness Scale (Kobasa, 1979), and negative discriminant correlations ($r = -0.34$, $p = .11$) with the Arizona Sexual Experience Scale (ASEX) (McGahuey, Gelenberg, Laukes, Moreno, & Delgado, 2000).

To draw context for inductees' resilience, CD-RISC scores were compared to groups measured within the original development of the scale. In this validation process, contributors were from (a) the general population ($n=577$) and (b) individuals with specific mental health problems ($n=250$), with a collective $M (SD)$ age of 43.8 (15.3) years and comprising 65% females ($n=510$) and 274 males. Academic performance of inductees was measured by end of Year 1 grade classifications, failure to complete studies / withdrawal rates with alignment achieved using anonymised student ID numbers. Four separate grade boundaries classify the level of academic attainment ranging from Third (lowest level of academic attainment) to First which is the highest. Descriptive statistics (frequencies, descriptives and crosstabulations) were used to evaluate these data.

Stage 2

To ascertain the relationship of psychological resilience to academic performance, bivariate correlations were undertaken between resilience scores, end of Year 1 academic attainment, and failure to complete studies / withdrawal rates. Binary logistic regressions were also conducted to test the capability of inductees' psychological resilience for predicting membership of or one or two groups of prospective academic attainment.

Stage 3

A two-step cluster analysis generated an optimal number of homogenous groups based on gender, total resilience and the five subscale scores. This technique is ideal for identifying subgroups of cases with shared characteristics based on large sets of categorical and continuous data (e.g., >200) (Dodd, Al-Nakeeb, Nevill & Forshaw, 2010). Multivariate Analysis of Variance (MANOVA) identified differences in resilience and subscales between the clusters.

Stage 4

Emergent clusters were cross tabulated with end of Year 1 grade classifications and failure / withdrawal rates.

Results

Resilience by gender and academic outcome

Table 1 details psychological resilience and end of Year 1 grade classifications for 1534 student participants. It illustrates non-significant gender differences were found for Total Resilience and for all subscales except Spirit. There was also no gender difference for end of

Year 1 mean grade classifications, which were within the 2:2 grade boundary for both groups. Profiles of resilience for the four annual cohorts contributing to these data showed that there were no significant differences between the years of entry (2005-2008) into HE. Figure 1 draws descriptive comparisons of inductees' Total Resilience to groups measured within the original validation of the instrument (Connor & Davidson, 2003), suggesting that these students lie between a normative population sample of adults and similar individuals presenting mental health issues in primary care.

TABLE 1. Biographical details and resilience measures

Variable (low to high range)	Mean (SD)		
	Males	Females	All
Sample <i>N</i>	794	740	1534
Age (17-49 years)	18.82 (1.74)	18.57 (1.55)	18.70 (1.66)
End of Year 1 grade +	51.67 (13.23)	51.58 (19.58)	51.63 (16.71)
CD-RISC Resilience subscales			
Competence (0-32)	26.39 (4.42)	26.04 (4.52)	26.22 (4.47)
Trust (0-28)	20.10 (3.85)	19.85 (3.92)	19.98 (3.88)
Change (0-20)	15.59 (3.13)	15.55 (3.31)	15.57 (3.22)
Control (0-12)	9.06 (1.95)	9.13 (2.06)	9.09 (2.00)
Spirit (0-8)	4.03 (1.98)	4.43 (1.83)*	4.22 (1.92)
CD-RISC Total (0-100)	75.18 (12.53)	74.99 (13.16)	75.09(12.83)

+Grade classifications (40-50 Third, 50-60 2:2, 60-70 2:1, 70+ First, *N*=1434)*Males v Females, indep t test, *t* (1532) = 4.11, *p*<.001

FIGURE 1 : Comparison groups quartile ranges, means and standard deviations for CD-RISC

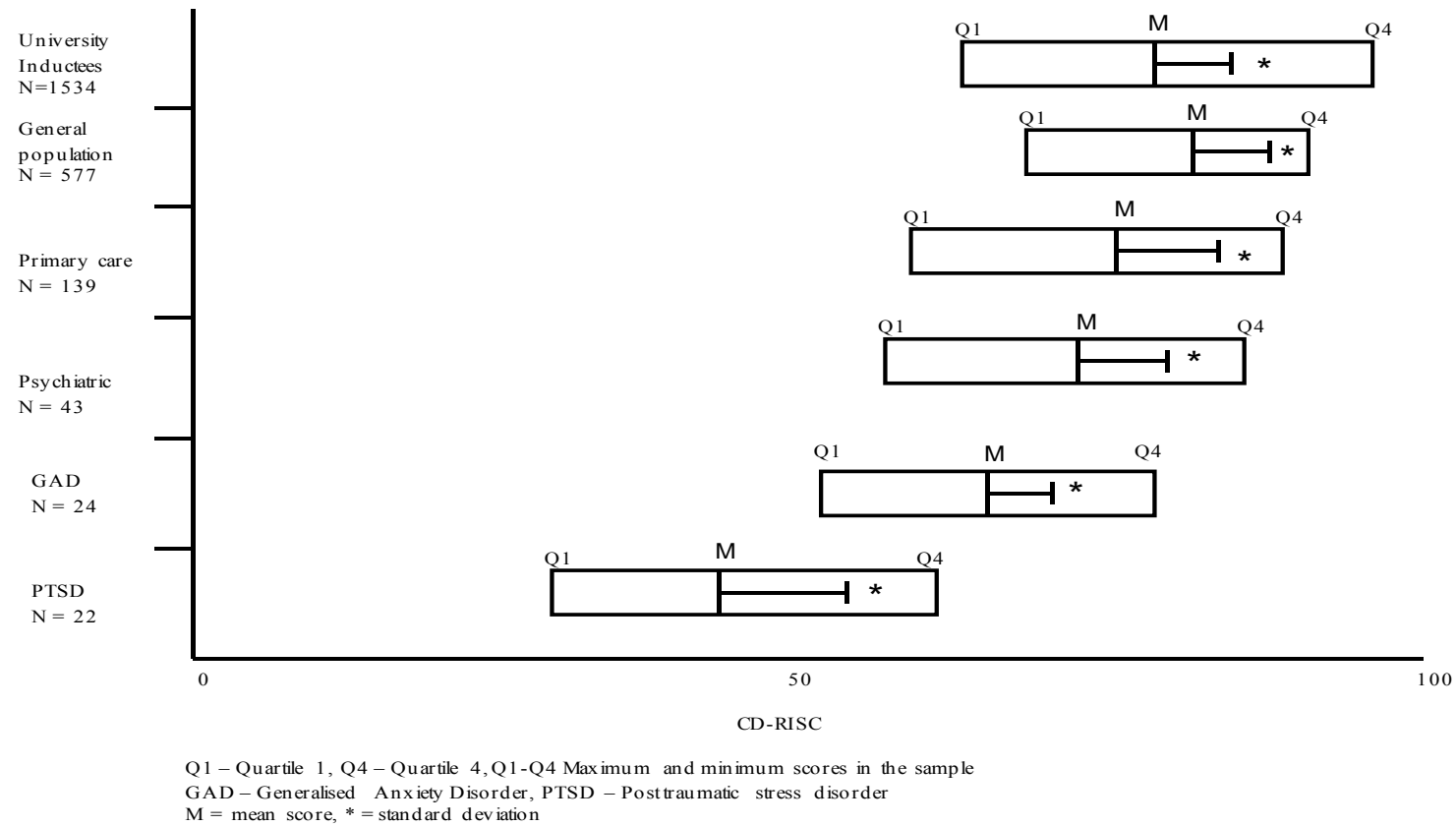


Table 2 outlines the quartiles for Total Resilience and subscales. Columns show Total Resilience and subscale range categories ranging from “low” to “very high”. Total Resilience was most spread within the “low resilience” group (31-64), range=33. Rows detail the percentage figures for Total Resilience and subscale categories for all participants. Percentage counts within each category highlight gender differences. More females reported “low” (25.2%) and “very high” Total Resilience (26.3%) and “low” Competence (28.6%), were “very high” in Control (29.2%) and “high” in Spirit (37.6%). Males populated the “very high” group for Competence (30.1%) and Trust (30.0%) and the “low” group for Spirit (25.4%).

TABLE 2. Resilience and subscale ranges

Variable	Total Resilience Category (score range)															
	Low (31-64)				Mid (65-76)				High (77-85)				Very High (86-99)			
	Range	M %	F %	All %	Range	M %	F %	All %	Range	M %	F %	All %	Range	M %	F %	All %
CD-RISC (31-99)	31-64	22.8	25.2	23.6	65-76	26.8	23.3	25.1	77-85	25.8	25.2	25.5	86-99	24.7	26.3	25.4
Competence (7-32)	7-23	25.6	28.6	27.0	24-26	20.0	18.8	19.4	27-29	24.3	24.6	24.5	30-32	30.1	28.0	29.1
Trust (6-28)	6-16	19.9	21.6	20.7	17-19	20.1	21.3	20.7	20-22	30.0	29.4	29.7	23-28	30.0	27.7	28.9
Change (5-20)	5-12	18.1	19.6	18.8	13-15	26.1	25.4	25.7	16-17	23.7	21.4	22.6	18-20	32.1	33.6	32.9
Control (2-12)	2-6	10.5	11.1	10.8	7-8	27.5	24.9	26.2	9-10	35.1	34.9	35.0	11-12	27.0	29.2	28.0
Spirit (0-8)	0-2	25.4	15.7	20.7	3-4	34.5	32.8	33.7	5-6	27.2	37.6	32.2	7-8	12.8	13.9	13.4

Relationships between resilience and academic outcome

For the whole sample, bivariate correlation analysis revealed a positive association between Total Resilience and end of Year 1 grade classifications, failure / withdrawal rates $r(1532) = .063, p < 0.05$. Positive, small correlations were also observed between end of Year 1 grade classifications, failure / withdrawal rates and the resilience subscales of Competence $r(1532) = .076, p < 0.01$, and Change $r(1532) = .077, p < 0.01$. In males no correlation was found between Total Resilience or subscales and their end of year performance. Females recorded a positive correlation between Total Resilience and subsequent end of year attainment $r(738) = .114, p < 0.01$, with positive relationships also noted for the subscales of Competence $r(738) = .116, p < 0.01$, Trust $r(738) = .097, p < 0.01$, Change $r(738) = .116, p < 0.01$, and Control $r(738) = .085, p < 0.05$.

Given appropriate goodness of fit tests, binary logistic regression analysis demonstrated that psychological resilience made a significant contribution ($p = .018$) to predicting the likelihood of inductees achieving the two highest grade categories. For the whole group, every increment of resilience (range 0-100) significantly increased the chances of acquiring the highest grades by 1%. This rose slightly ($OR = 1.014$, 95% C.I. 1.003 to 1.026) for females, whereas males' resilience did not predict academic outcome ($p = .374$). Further, while the male value were not predictive, for females the odds of acquiring grades above 2:2 (vs lower classification) rose by almost 2% ($OR = 1.109$, 95% C.I. 1.005 to 1.032) for every increment of resilience (2005-2008).

Cluster analysis

To develop a deeper understanding of links between gender and resilience, a two-step cluster analysis was performed. Table 3 outlines the Total resilience and subscale profiles for four emergent homogenous clusters each of at least 247 inductees. These were named according to

their dominant variables. High resilience females (Total Resilience $M = 82.83$, $SD = 7.25$) narrowly comprised the largest cluster (32.1%) from High resilience males (Total Resilience $M = 83.76$, $SD = 6.42$) who made up 31.5% of the population. Low resilience males (Total Resilience $M = 61.86$, $SD = 6.69$) and Low resilience females (Total Resilience $M = 59.34$, $SD = 6.78$) made up 20.3% and 16.1% of subjects respectively. The MANOVA revealed significant differences between the four cluster groups for Total Resilience $F(3, 1530) = 1304.00$, $p < 0.05$, and for the subscales of Competence $F(3, 1530) = 734.24$, $p < 0.05$, Trust $F(3, 1530) = 517.22$, $p < 0.05$, Change $F(3, 1530) = 674.42$, $p < 0.05$, Control $F(3, 1530) = 451.73$, $p < 0.05$, and Spirit $F(3, 1530) = 149.52$, $p < 0.05$. Follow-up post hoc tests revealed no significant mean differences for Total Resilience or any of the subscales between male and female High resilience cluster groups which characterised the most positive behaviours. There were significant mean differences ($p < 0.05$) for Total Resilience and subscales between High and Low resilience groups and between the two Low resilience groups for Total Resilience and Competence.

Table 3: Cluster group profiles of resilience

Variable (low to high range)	Cluster groups			
	Mean (SD)			
	High resilience males	High resilience females	Low resilience males	Low resilience females
<i>N</i> (% of total)	483(31.5%)	493(32.1%)	311(20.3%)	247(16.1%)
CD-RISC Resilience (0-100)	83.76 (6.42)	82.83 (7.25)	61.86 (6.69)*	59.34 (6.78)* **
CD-RISC Resilience subscales				
Competence (0-32)	29.12 (2.40)	28.50 (2.67)	22.17 (3.41)*	21.14 (3.31)* **
Trust (0-28)	22.31 (2.67)	21.81 (2.77)	16.68 (2.75)*	15.94 (2.79)*
Change (0-20)	17.49 (1.84)	17.31 (2.06)	12.64 (2.34)*	12.02 (2.41)*
Control (0-12)	10.12 (1.40)	10.14 (1.44)	7.42 (1.48)*	7.11 (1.57)*
Spirit (0-8)	4.72 (1.84)	5.08 (1.54)	2.95 (1.69)*	3.13 (1.68)*

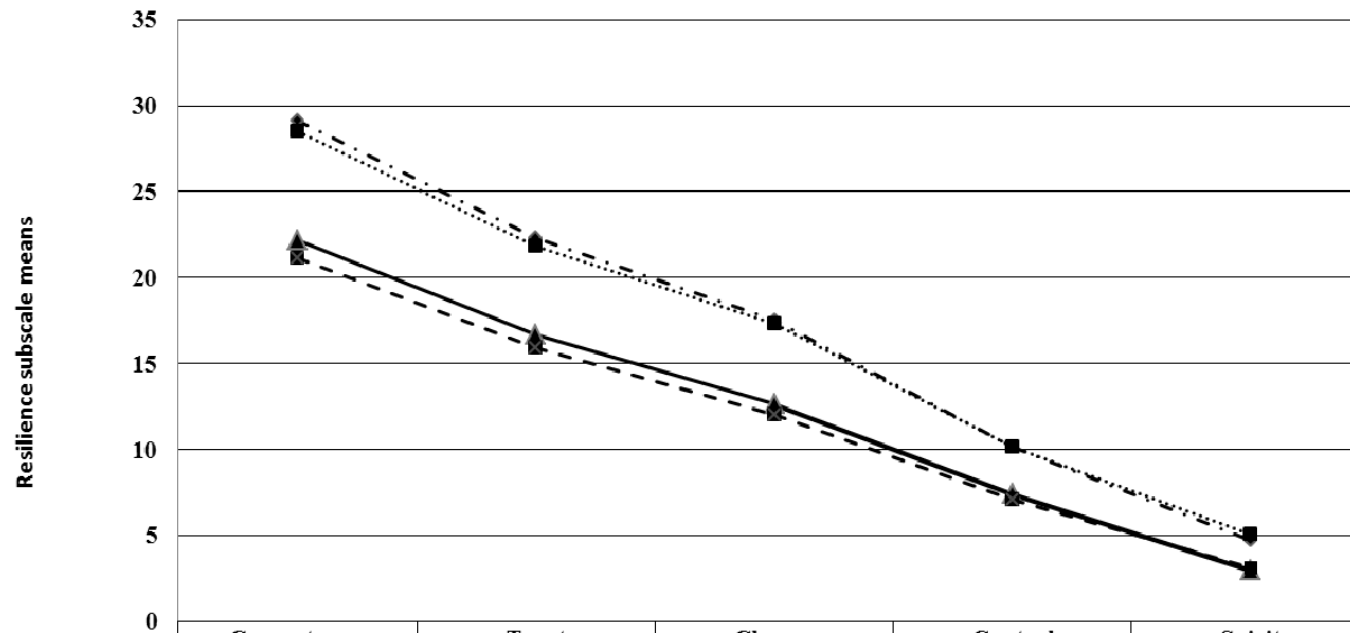
* High resilience m/f – Low resilience m/f $p < 0.05$ ** Low resilience m – Low resilience f $p < 0.05$

Cross tabulations of cluster groups with academic outcome

To establish how these new resilience-gender clusters were linked to academic outcomes, cluster groups were cross-tabulated with end of Year 1 grade classifications, failure / withdrawal rates and detailed on a graph. Figure 2 shows that High resilience males were consistently outperformed academically by both female clusters. A quarter of High resilience males failed, withdrew or achieved a Third class Year 1 outcome. Over 80% of High resilience males achieved a 2:2 grade or less. Over 80% of High resilience females and three quarters of Low resilience females attained a 2:2 or above. Females achieved twice as many 2:1 classifications and almost six times more Firsts than their male counterparts.

FIGURE 2: Two step clusters of resilience and end of year 1 grade classifications, failure / withdrawals

FIGURE 2: Cluster group profiles of resilience subscales



Competence Trust Change Control Spirit

— ◆ — High R Males N=483 (31.5%)	29.12	22.31	17.49	10.12	4.72
... ■ ... High R Females N=493 (32.1%)	28.5	21.81	17.31	10.14	5.08
— ▲ — Low R Males N=311 (20.3%)	22.17 *	16.68 *	12.64 *	7.42 *	2.95 *
— ■ — Low R Females N=247 (16.1%)	21.14 * +	15.94 * +	12.02 *	7.11 *	3.13 *

+ Cluster variables

* High resilience m/f – Low resilience m/f $p < 0.05$ + Low resilience m – Low resilience f $p < 0.05$

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Discussion

The present study sought to provide a cross sectional profile of inductees' psychological resilience on entry into HE and to highlight any association to respective end of Year 1 academic achievement. Findings suggest that, overall, inductees' mean resilience was indicative of a group possessing less adaptive capability than adults within the general population (Connor & Davidson, 2003). This may be linked to declining mental health, poor resilience and transition of some new students entering HE (e.g. Royal College of Psychiatrists, 2006, Paton, 2010, Yorke, 2000). Nonetheless, consistent with resilience theory and correlates of resilience to academic success (e.g. Martin & Marsh, 2006), positive associations were found between inductees' resilience and prospective academic achievement. Although end of Year 1 mean grades suggested similar academic performance by gender, resilience seemed to be more facilitative of subsequent academic outcomes in females than males. Higher resilience was progressively and incrementally associated with higher grade profiles for female inductee, contrary to the conventional understanding of resilience, higher resilience was linked with poorer prospective academic performance for males. Cluster analysis revealed that twice as many High resilience females attained the two highest grade classification outcomes than High resilience males. Low resilience females achieved 17% fewer failures /withdrawals and the two lowest grade categories than Low resilience males. These findings have implications for practitioner support practice in HE. Mental health vulnerabilities and links between resilience and prospective achievement may prompt the use of strategies to build adaptive capacity across inductee populations. To acquire parity with females' academic performance, males may require pedagogical approaches which improve the productivity of their resilience for academic functioning.

Psychological resilience and prospective academic achievement

Psychological resilience may encompass adaptive behaviours which are not synonymous with mental health (Norris, Stevens, Pfefferbaum, Wyche & Pfefferbaum, 2008). Young people who function well under high stress have often displayed higher levels of emotional distress compared to low stress peers (Olsson, Bond, Burns, Vella-Broderick & Sawyer, 2003). Nevertheless, these inductees recorded mean resilience similar to that of adults with symptomatic mental health problems in primary health care (Connell, Barkham & Mellor-Clark, 2007). As psychological distress tends to increase with time across degree courses (Andrews & Wilding, 2004), early identification and remediation of mental health issues may be important especially within widening participation universities.

Positive associations between inductees' psychological resilience and prospective academic performance was consistent with studies where resilience enabled favourable educational outcomes (e.g. Esquivel, Doll & Oades-Sese, 2011). Unique to this study, females' resilience was more facilitative of prospective achievement than were males with similar resilience scores, which equated to relatively poorer outcomes. The facilitative quality of females' resilience was illustrated through positive predictive relationships between respective academic outcomes and cluster groups which outperformed both of the male cluster counterparts. Explanations for females' more productive resilience were not readily observable by comparing their mean resilience scores, quartile range categories or cluster group profiles. However, recurring themes within these data may have suggested the influence of gender-related resilience. Spirituality, which featured strongly in females' resilience, has been associated with resilience and better academic attainment in female university students (Hammermeister, Amani El-Alayli, Ridnour, & Peterson, 2005; Kim & Esquivel, 2011). High competence was evident in male inductees which may have suggested that some students over estimated their abilities at the outset of their studies.

Propensities within patterns of resilience may offer plausible explanations for differences in subsequent achievement. However, grouped data may conceal the dynamic,

individualised nature of resilience which varies with differing stressors or outcomes over time (Kaplan, 1999; Lepore & Revenson, 2006). For example, males high in resilience represented the largest number of withdrawals, and while this may seem to signify a negative outcome, it could also have been symbolic of purposeful action undertaken to maintain homeostasis. Irrespective of resilience profile differences, female inductees' resilience on entry into HE was more functional than that of males for representing potential academic success. Given the mental health profiles of inductees, female students were also more capable, even with absolute scores, to perform better academically than their male peers despite the presence of negative affect.

Resilience for inductees in higher education

In educational contexts resilience has been valued for its links to protective qualities which help students to be successful (Prince-Embury, 2011). Data generated from four annual cohorts provided consistent evidence that sub-domains of psychological resilience may have been indicative of the strength-based behaviour (i.e. relatedness, sense of mastery) each of which has been recognised as important for students overcoming barriers for learning. These facets of adaptive functioning relate closely with enabling factors in life span transitions, such as emotional security, having clear goals, and a supportive work environment (Williams, 2008). They also resonate with pedagogically helpful strategies such as the development of strong and caring relationships, academic efficacy and autonomy which have contributed to students' success in schools and are recognised as important for retention and achievement in HE (Barefoot, 2000; Wilcox, Winn & Fyvie-Gauld, 2005).

From this, it may be assumed that empirical investigations into resilience are useful for framing educational services and student support practices in HE. Within this study,

binary logistic regressions reported that relatively small improvements in female inductees' resilience progressively improved their chances of acquiring better prospective grades. It also indicated that the scale was sensitive for identifying this capacity for growth. Strategies employed to develop their resilience could be universally applied and targeted at females in the low resilience category (Table 2) who may have provided the most potential for improvement (highest range of scores). Although males showed signs of resilience in respect to attainment (almost one fifth of High resilience males attained a 2:1 grade or above), a large proportion failed to align their resilience with corresponding academic achievement. The convoluted nature of males' resilience may necessitate that support staff become more adaptable in meeting their needs, there is a need to provide equitable practices to those which accommodate females' strengths. Recognising that resilience is derived from overcoming challenges which can shape future success, some male inductees may need to re align their strengths to develop a more balanced appreciation of their inflated capabilities. They may also need to be encouraged to access help where necessary and work in a collaborative manner to help diffuse the impact of academic stress. Such issues have been identified and have formulated a pattern of targeted support for male students (Laurence, 2009; McMinn & Reeves, 2009; Dominey & Burns, 2010). Given the diversity of incoming students into HE, it may be important that resilience should not be over-generalised or used to stigmatise groups, even though individual characteristics of students are very important predictors of students' success in education (Condly, 2006). However, using resilience as a conceptual platform for highlighting prospective functioning could help inductees and their mentors to identify particular barriers to personal achievement, particularly with regard to primary prevention of mental health problems.

Limitations and future considerations

This study provides a unique insight into inductees' resilience and links to their prospective attainment; however, there are caveats to these findings. Although the sample size was large, inductees were recruited from a single university, and therefore, findings cannot be generalised across the HE sector. The CD-RISC instrument may have provided opportunities (especially to males) to self-report a favourable one-off impression or record a highly scored set of undifferentiated answers. As data was captured in a single timeframe, the assessment of resilience could not incorporate the fluctuating demands of a full academic cycle that interim measures or qualitative analyses may have afforded. End of Year 1 grade classifications only represented one aspect of competent functioning; resilience for some inductees may have constituted achievement of the so-called lesser grades. Nonetheless, these issues (which may be incorporated into future studies), need to be digested in light of the positive way resilience may be used to identify needs and prospective outcomes for a large number of students.

University inductees and those who support them are likely to require resilience for effecting transitions within HE. Psychological resilience may help to explain the maintenance of successful functioning despite potential disruptions to well-being. In today's climate of increasing uncertainty, many risk factors which contribute to the poor performance of students in HE may be difficult to control (e.g. financial problems, family issues). Nevertheless, the strength of community and family predictors of educational success, suggest that HE can be a core setting for developing protective sources for new students. Further, given the financial pressures placed upon the institutional health of universities for non-completion of students, it may be important for them to develop strategies for inductees to succeed.

The development of interventions to build resilience in new students will require knowledge of risk and resilience. Although the current data suggests the need for more nuanced analysis of inductees' resilience, especially according to gender, this study has

provided empirical links between psychological resilience and prospective academic functioning. This indicates that profiling inductees' resilience may be justified for identifying incoming needs and developing strengths. As an evidence-based tool, it could also act as a baseline against which to measure the impact of practices that may be implemented. In line with other studies assessing the evolving mental health capacities of university students (e.g. Robotham, 2008), further investigations into practices which promote resilience in inductees may require longitudinal evaluations of resiliency processes in context and over time (inductees resilience combined with the changing environmental demands of HE). Such analysis of variables in an interactional and causal fashion may further explain the direct impact of resilience upon academic outcomes and the transition of students into HE and beyond.

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